

Wireless Mesh Network with Small and Low Cost Devices

The goal of this project is to implement a wireless mesh network that provides connectivity and multimedia services in a geographic area such as a small campus.

- TP-Link [MR3020](#) wireless router.
- USB WLAN adapter based on the [Ralink RT5370](#) chipset.
- Raspberry Pi [Model B](#).

Make sure you have the [attitude adjustment](#) release of OpenWRT on your TP-LINK MR3020. For more information on how to flash the firmware on your router and take basic control, please refer to [this article](#).

Start by updating the package list and installing the necessary packages for the USB WLAN adapter.

```
root@MeshNode:~# opkg update
root@MeshNode:~# opkg install kmod-rt2800-lib kmod-rt2800-usb kmod-rt2x00-
lib kmod-rt2x00-usb
```



Figure 1. MR3020 with WLAN adapter

Plug the WLAN adapter on the USB port of your router and verify that it is detected:

```
root@MeshNode:~# wifi detect
config wifi-device radio2
    option type mac80211
    option channel 11
    option macaddr 00:e0:4c:81:88:8a
    option hwmode 11ng
    option htmode HT20
    list ht_capab GF
    list ht_capab SHORT-GI-20
    list ht_capab SHORT-GI-40
    list ht_capab RX-STBC1
    # REMOVE THIS LINE TO ENABLE WIFI:
    option disabled 1

config wifi-iface
    option device radio2
```

```
option network lan
option mode ap
option ssid OpenWrt
option encryption none
```

Now, copy the detected WiFi modules into the wireless configuration of your MR3020.

```
root@MeshNode:~# wifi detect > /etc/config/wireless
```

Your wireless configuration file should be similar to the following:

[/etc/config/wireless](#)

```
config wifi-device radio0
    option type mac80211
    option channel 11
    option macaddr f8:d1:11:bd:62:ce
    option hwmode 11ng
    option htmode HT20
    list ht_capab SHORT-GI-20
    list ht_capab SHORT-GI-40
    list ht_capab RX-STBC1
    list ht_capab DSSS_CCK-40

config wifi-iface
    option device radio0
    option network lan
    option mode ap
    option ssid OpenWrt1
    option encryption none

config wifi-device radio1
    option type mac80211
    option channel 11
    option macaddr 00:e0:4c:81:88:8a
    option hwmode 11ng
    option htmode HT20
    list ht_capab GF
    list ht_capab SHORT-GI-20
    list ht_capab SHORT-GI-40
    list ht_capab RX-STBC1

config wifi-iface
    option device radio1
    option network lan
    option mode ap
    option ssid OpenWrt2
    option encryption none
```

Check that both antennas are working:

```
root@MeshNode:~# wifi up
Configuration file: /var/run/hostapd-phy0.conf
Using interface wlan0 with hwaddr f8:d1:11:bd:62:ce and ssid "OpenWrt1"
Configuration file: /var/run/hostapd-phy1.conf
Using interface wlan1 with hwaddr 00:e0:4c:81:88:8a and ssid "OpenWrt2"
```

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